Column Coupler Recommendation for Guard Columns to Analytical Columns - Tech Information

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How to Select the Correct Column Coupler for Pairing HPLC Columns with Guard Columns

When connecting a guard column directly to an analytical HPLC column, minimizing dead volume is critical for preserving chromatographic efficiency.

We recommendss the **ARE–Applied Research™ brand** of column couplers for this application. These precision-machined unions allow a direct, low-volume connection that maintains column performance while simplifying your flow path.

Why Coupler ID Selection Matters

The internal diameter (ID) of the coupler's through-hole directly influences system backpressure, mixing volume, and the integrity of fast or high-resolution separations. As flow rate increases, a slightly larger ID is required to prevent unnecessary restriction and ensure proper linear velocity through the connection.

Choosing the correct ID prevents:

- Band broadening from excessive mixing
- Pressure buildup caused by undersized openings
- Efficiency loss in gradient or UHPLC-style methods

Recommended Column Couplers by Flow Rate

The ARE series is available in four through-hole sizes, each tied to a specific flow-rate range. MICROSOLV provides the following selection guide:

Flow rate (*milliliters / minute*)	**Through Hole** (mm)	**Through Hole** (inch)	**Column Coupler *Cat. No.***
up to 0.5	0.13	0.005	47450-01
≤1.0	0.18	0.007	47450-02
1.0 - 2.0	0.25	0.010	47450-03

≥2.0	0.50	0.020	47450-04

These unions are engineered for **direct, inline series connection** between columns or between a guard column and analytical column—making them ideal for high-efficiency methods where minimizing extra-column volume is essential.

Application Tips for Best Performance

To ensure optimal behavior of the coupler in real-world methods:

- Keep all tubing lengths as short as possible on either side.
- Verify ferrule seating to maintain leak-free operation.
- Avoid mixing metal and polymer fittings to prevent deformation.
- Match the coupler ID to your *highest expected* method flow rate.

These best practices help maintain the performance of advanced column technologies—including TYPE-C™, Bidentate C18™, and Diamond Hydride™ phases—where efficiency losses are more noticeable.

Additional Resources

Product images, ordering options, and the downloadable PDF guide are available through the MICROSOLV website.

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